

In re: Robert D. Black
Serial No.: 10/005,889
Filed: November 7, 2001

Listing of Claims:

- 1.-7. (Canceled)
8. (Currently amended) A circuit for detecting biomolecules *in vivo*, the circuit comprising
an optical radiation source configured for *in vivo* use that emits first optical radiation;
an optical radiation detector configured for *in vivo* use that detects second optical radiation emitted by excited labeled binding molecules; and
a processor circuit, coupled to the optical radiation source and the optical radiation detector, ~~that controls the emission of the first optical radiation wherein the processor circuit is configured to operate in conjunction with the release of labeled binding molecules for excitation by the first optical radiation~~ and that receives an intensity signal associated with the intensity of the second optical radiation ~~and transmits a signal associated with the intensity of the second optical radiation to an ex vivo system.~~
9. (Currently amended) A circuit according to Claim 8, wherein the optical radiation source ~~is selected from a group consisting of a LED and~~ comprises a laser.
10. (Original) A circuit according to Claim 8, wherein the optical radiation detector is selected from a group consisting of a phototransistor, a photodiode, and a photomultiplier.
11. (Original) A circuit according to Claim 8, wherein the first optical radiation has a first frequency and the second optical radiation has a second frequency.
12. (Original) A circuit according to Claim 11, wherein the first frequency is greater than the second frequency.

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13. (Previously presented) A circuit according to Claim 8 further comprising:
an emission filter coupled to the optical radiation source; and
an absorption filter coupled to the optical radiation detector.
14. (Original) A circuit according to Claim 8, further comprising:
an inductor coupled to the processor, wherein the inductor provides power to the
circuit in response to a power signal received from the *ex vivo* system.
15. (Original) A circuit according to Claim 8, wherein the circuit is on a platform
having a diameter of about 2mm.
16. (Previously presented) A circuit according to Claim 8, wherein the signal is
digitally encoded.
17. (Currently amended) A circuit according to Claim 8, wherein the circuit is on
a platform coated with a biocompatible optical translucent layer.
- 18.-28. (Canceled)
29. (Previously presented) A circuit according to Claim 8 wherein the first and
second optical radiation comprises first and second optical radiation at respective first and
second wavelengths selected to promote transmission of the first and second optical radiation
through a bio-fouling tissue on the optical radiation source and the optical radiation detector.
30. (Currently amended) A circuit according to Claim 8, wherein the circuit
comprises ~~a chronically~~ an implantable circuit configured for *in vivo* implantation for at least
six months.

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31. (Previously presented) A circuit according to Claim 8 wherein the processor circuit is further configured to provide the signal for wireless transmission to the *ex vivo* system.

32. (Previously presented) A circuit according to Claim 8 wherein the processor circuit is configured to control the release of labeled binding molecules for excitation by the first optical radiation.

33. (Currently amended) A circuit according to Claim 8, wherein the processor circuit is configured to ~~enable~~ active the optical radiation detector a predetermined time interval after activating ~~enabling~~ the optical radiation source.

34. (New) A circuit according to Claim 33, wherein the selectable time interval is determined to allow unbound labeled binding molecules to dissipate beyond a range of the first optical radiation prior to providing the first optical radiation.

35. (New) A circuit according to Claim 8 further comprising:
a piezoelectric circuit responsive to the processor circuit, wherein the piezoelectric circuit is configured to vibrate under control of the processor circuit to release the labeled binding molecules.

36. (New) A circuit according to Claim 8, wherein the processor circuit is further configured to control release of unlabeled binding molecules separate from the labeled binding molecules.

37. (New) A circuit according to Claim 36 wherein the processor circuit is further configured to release of the unlabeled binding molecules out of phase with the labeled binding molecules.

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38. (New) A circuit for detecting biomolecules *in vivo*, the circuit comprising:
an *in vivo* optical radiation source configured to emit first optical radiation;
a first *in vivo* optical radiation detector configured to detect the first optical radiation
to provide an optical radiation source feed back signal;
a second *in vivo* optical radiation detector configured to detect second optical
radiation emitted by excited labeled binding molecules; and
a processor circuit, coupled to the *in vivo* optical radiation source and the first and
second *in vivo* optical radiation detectors, configured to change a level of the first optical
radiation based on the optical radiation source feed back signal.

39. (New) A circuit according to Claim 38 further comprising:
a circuit board having the processor circuit and, the first and second optical radiation
detectors thereon, wherein the first and second optical radiation detectors are on opposing
sides thereof.

40. (New) A circuit for detecting biomolecules *in vivo*, the circuit comprising:
an *in vivo* optical radiation source configured to emit first optical radiation;
an *in vivo* optical radiation detector configured to detect second optical radiation
emitted by excited labeled binding molecules; and
a processor circuit, coupled to the *in vivo* optical radiation source and the *in vivo*
optical radiation detector, configured to operate in conjunction with the release of labeled
binding molecules for binding with biomolecules associated with tumors for excitation by the
first optical radiation and that receives an intensity signal associated with the intensity of the
second optical radiation.

41. (New) A circuit for detecting biomolecules *in vivo*, the circuit comprising
an *in vivo* optical radiation source configured to emit first optical radiation;
an apparatus configured to controllably release labeled binding molecules for
excitation;

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an *in vivo* optical radiation detector configured to detect second optical radiation emitted by excited labeled binding molecules; and

a processor circuit, coupled to the *in vivo* optical radiation source, the *in vivo* optical radiation detector, and the apparatus, the processor circuit configured to control the emission of the first optical radiation and to receive a signal associated with the intensity of the second optical radiation and configured to temporally control release of labeled binding molecules from the apparatus according to a predetermined time interval.

42. (New) A circuit according to Claim 41 wherein the apparatus is in communication with a vibrator configured to vibrate responsive to control of the processor circuit